THE ARGUMENT

BOOK I

1–43 : the poet calls upon Venus, as mother of the Romans, author of their being to all living creatures and sole mistress of the nature of things, to help him in writing on that theme ; but first to constrain her lover Mars the lord of war to grant peace to the Romans in order that he himself might have ease of mind to write, and his friend Memmius leisure to read what he wrote.

50–61 : he calls on Memmius to attend, while he explains the nature of the first elements of things.

62–79 : human life lay prostrate beneath religion, until a man of Greece rose up, explained the true system of the universe, and trampled on religion in turn.

80–101 : think it not sinful thus to spurn religion : nay rather it is religion who is the mother of unholy deeds ; such as the sacrifice of Iphigenia by her own father.

102–135 : 'you will yourself at times fall away from me, frightened by vain tales of eternal punishment, which men adopt from ignorance of the soul ; about the nature of which there are many false theories : one is that of transmigration adopted by poet Ennius ; his hell being peopled only by phantoms of the living. I must therefore in addition to what I have already promised explain the true nature of the soul, as well as of those idols which frighten us in sickness or sleep.'

136–145 : ‘ the task is difficult ; but love of you and your worth encourages me to labour to make these questions clear.’

146–158 : this terror and darkness of mind must be dispelled by the knowledge of nature ; whose first principle is ‘ nothing can be produced from nothing by divine power ’ : from this truth all the rest will follow.

159–214 : ‘ if things could come from nothing, any animal might be born any where, any fruit grow on any tree. But that every thing comes from a definite seed is proved in many ways : flowers corn fruits come at stated seasons : again animals and plants require time to grow up : the products of the earth want rain at stated times, animals food : men are of a definite size, and never grow to a gigantic bulk : lastly the fruits of the earth require cultivation, and do not improve spontaneously.’ From the nature of the case this is rather a full statement of what he means by nothing coming from nothing than a proof : his theory of fixed unchangeable seeds of things or atoms he subsequently demonstrates with masterly clearness and power : some of his arguments even Newton seems not to have disdained to borrow.

215–264 : nothing can be reduced to nothing : things dissolve only into their first-beginnings : if this were not so, a thing might pass away in a moment without any force : again how could all things, animate and inanimate, be replenished ? if nothing were imperishable, infinite time past must have reduced all things to nothing : a mere touch would destroy all things alike : rains pass away ; but the earth which receives them sends forth her produce ; and from it all animals are nourished : nothing therefore is utterly destroyed.

265–328 : ‘ doubt not what I say of first-beginnings, because they are not seen : many things in

being you know by their effects, yet cannot see: winds work mischief in sky, on earth and sea; yet are not seen: they act by pressure just like rivers which are seen: smells heat cold sounds are not seen; yet have all body since they are in contact with sense: moisture leaves clothes without being seen: metals stones wear away; things grow, and decay, as rocks from sea-brine; yet the process of growth and decay is unseen in all.'

329–369: but there is void as well as body in things; else there could be no motion, no birth, no growth: the hardest things can be penetrated; and therefore have void in them: again things of equal size are not all of equal weight, only because one contains more or less void than another.

370–397: some falsely maintain that motion may take place thus: a fish for example advances, because the water it displaces goes into the space which it leaves. But without void how can water begin to give place, that the fish may begin to advance? Again two bodies in contact start asunder: there must be void between the two at all events until the air has filled this space: if you say the air condenses when the bodies are together, I assert that air cannot so condense; and if it could, it could not thus contract without void.

398–417: much more might I say; but a keen intellect can now by itself pursue the question farther: if however you demur, I have such store of arguments in reserve that our life will come to an end sooner than they.

418–448: all nature then consists of body, and void in which body moves: deny the existence of body, you take away the foundation on which rests all reasoning about abstruse things: without void no motion is possible as I have just shewn. There is no third nature distinct from these two: if a thing can touch or be touched, it is of the class of

body ; if it cannot, of void : neither sense nor reason can grasp any third class.

449–482 : all other things are either inseparable properties or accidents of matter or void : time also exists not by itself : from the things that go on follows the feeling of past present and future : the actions done at the siege of Troy for instance did not exist by themselves, but were mere accidents of the men there or the places there : without body and space nothing which there happened could have happened.

483–502 : the first-beginnings are perfectly solid and indestructible : sense suggests no notion of this solidity : reason can alone prove it.

503–550 : where void is, body is not : these first bodies therefore are solid and without void : things in being, all contain pure void enclosed by pure body : these first bodies then may continue, when the things are broken up : and void we have shewn must exist ; it alternates then with body : these first bodies cannot be crushed split or broken up from within ; they are therefore eternal : without this eternal matter all things would have come from nothing, and would have been reduced to nothing : first-beginnings therefore are of solid singleness.

551–576 : if these first bodies did not set a limit to the division of things, nothing could come into being ; for as things are destroyed more quickly than renewed, infinite time to come could not restore what infinite time past had gone on breaking up : again with solid first bodies the existence of soft things can be explained by help of void : with soft first bodies the existence of hard things cannot be understood.

577–598 : again we do see things in being : they must have had first-beginnings : could then these first-beginnings, if soft, have withstood the blows

of infinite time ? the persistency too of specific marks in living creatures seems to prove an unchangeable matter at bottom.

599–634 : these first-beginnings have parts, but their parts are so small as not to admit of existence separate from the atom : the atom therefore has not been formed from a union of these parts, but they have existed in it unchangeably from eternity : such parts then are but one more proof that the first-beginnings are of everlasting singleness : again without such ultimate least things, the smallest and largest thing will alike consist of infinite parts, and thus will be equal : again if nature went in division beyond the atom, such least things as these parts of the atom could not have the qualities which birth-giving matter must have, weight motion power of striking and clashing and combining.

635–644 : to maintain therefore with Heraclitus and his followers that fire is the element of all things is absurd.

645–689 : how could simple fire produce such a variety of things ? it is of no use to condense or rarefy fire, if it always remains fire : nay they deny void without which even this condensing and rarefying is impossible. But if they say the fire is extinguished in the process, they make things come from nothing. The truth is there are certain first bodies which are not like fire nor any thing in being, but which produce fire and all other things alike by their varied shapes motions arrangements collisions.

690–704 : again why do the senses, as Heraclitus says, perceive fire truly, but nothing else ? one might just as well deny the reality of fire and affirm that of all other things.

705–733 : for these reasons all err alike who affirm that any one of the four so-called elements, fire air water earth, is the first-beginning of things ;

or any two of these ; or all four, as Empedocles teaches, that famous poet and philosopher of the famous island of Sicily.

734–762 : he and the others have given responses truer than those of Phoebus ; yet all alike have gone to wreck on the first-beginnings of things : they deny a void in things, yet give them motion and leave them soft and rare ; and they set no limit to the division of things : if first-beginnings are soft, they were born and will die ; all things therefore have come from and will return to nothing : again such elements are hostile one to the other ; and thus, like lightning clouds winds, will be apt to fly asunder one from the other rather than combine.

763–781 : things too might just as well be their elements, since things by turns come from them and pass into them : but if you say that these elements remain unchanged in things, then nothing can be produced from them, since in everything they will shew their own several natures : first-beginnings must have no properties that sense can apprehend.

782–802 : again they suppose these elements to pass into each other in this ceaseless round, fire air water earth water air fire : but first-beginnings cannot thus change ; they must be eternal, and of such a nature that when some go away, others join, and the rest change their order, those which made fire may now make air or anything else.

803–829 : but, you will say, all these four elements are necessary for the production of things : true ; and without meat and drink, life cannot continue : the reason is the same in both cases : many first-beginnings are common to many things ; and the same by various mixtures motions and the like may produce the most different things ; just as the same letters go to quite different words.

830–874: the homoeomeria of Anaxagoras is equally defective: everything he supposes to consist of infinitely small particles of the same nature as the thing: bones of small bones, and so on: he denies too void and any limit to the division of things, like those above mentioned: such first-beginnings as these cannot resist destruction; so that things would return to nothing. Again, as food increases the body, the parts of the body are formed of things different in kind: or if you say all food has particles like the parts of the body contained in it, then meat and drink consist of particles different in kind: the same dilemma will apply to what grows out of the earth, to flame latent in wood, and the like.

875–896: Anaxagoras tries to extricate himself by assuming that everything is latent in everything; but that that only is perceived, of which the like particles are most numerous and most prominent: a manifest fallacy; for then corn when ground, stones when rubbed, grass when chewed, clods when pulverised, wood when split should shew little bloods, grasses, ashes and fires, respectively: the truth is that the seeds of things have no qualities like to those of things in being.

897–920: but you say trees often take fire by rubbing against each other: true, but for all that fire is not in them; else it would burst forth at any moment: the fact is fire and firs have many first-beginnings in common, just as the words have letters in common; but the two things, as the two words, are yet quite distinct. Again if you think a thing cannot be, unless its first-beginnings are of a like nature, then you must give these human feelings, in order that they may make a man.

921–950: 'listen now: inspired by the muses I enter on an untrodden path to cull a wreath yet worn by none: I am going to burst the bonds of

religion ; and clear up a dark subject by lucid verses, verses o'erlaid with the honey of the muses, in order to beguile my readers to their own profit, even as the rim of the cup is smeared with honey to entice children to drink the bitter but wholesome draught of wormwood.'

951–957 : 'I have proved the existence of indestructible atoms and of void or space : are these atoms infinite in number ? is this space infinite in extent ? '

958–987 : well then the universe is bounded on no side ; for then it must have an end or outside ; in which case there must be something beyond it, which may be seen to bound it ; but there can be nothing outside the universe, which is therefore boundless on all sides. Again say for the moment space is finite : go now to its verge and fling a javelin : will it go in the direction you throw it, or will it be stopped by something ? if there is something beyond to stop it, that something is in the universe ; if it goes on, it has not started from the end of space : therefore you will be always in the universe, wherever you fling it. Lastly whatever you see, is bounded by and into something different ; earth by sea, sea by earth and the like ; but what is there outside to bound the universe ?

988 (984)–1007 : but space or void is likewise infinite ; else matter during past eternity must have sunk in a mass to the bottom, and nothing could exist : but as space is infinite on all hands, there is no lowest point to which first-beginnings can tend : they have boundless room to move in for ever.

1008–1051 : and the sum of things and matter too are infinite : the other question proposed above : for space being infinite, if matter were finite, then nothing in being could exist one moment : this world for example and all its parts

would dissolve into their atoms ; or rather could never have existed ; for it is only by an infinite supply of matter that this earth and heaven can be maintained : the mutual clashings of atoms might keep this world, or any other world, supplied for a time ; but only for a time : nay without infinite matter, even these clashings could not go on.

1052–1082 : do not believe with some that all things tend to a centre, and therefore the world keeps together without external force, and things and animals beneath the earth cannot tumble into the sky any more than we can fly up to it : that our day is their night, their day our night : this is sheer folly : there is no centre in infinity, and, if there were, things would not be attracted any more than repelled by it : void everywhere alike yields to all body alike.

1083–1113 : again they teach that while earth and water tend to the centre, air and fire fly from it, and that the earth sends up food to the tree-tops : they thus contradict themselves : the truth is that the whole of this doctrine is alike false ; for, space being infinite, if matter were finite, the world and all that is in it, would in a moment dissolve into their first-beginnings : if on any one side matter fails, the door of destruction is opened to all alike.

1114–1117 : master fully what has been said, and the whole of nature will soon be revealed to you.

BOOK II

1–61 : sweet though it be to see from a place of safety the storm-tost sailor or the battling soldier, far sweeter is it from the heights of philosophy to look down on men lost in error and struggling for

power and wealth : what blindness not to see how little is wanted to rid us of pain and bring us every innocent pleasure ; often merely fresh air and fine weather, not palaces nor banquets ! can purple cure a fever ? It is not wealth or birth or power, no nor armies and navies that can free us from fear of religion and death, and all the cares of life : reason alone can deliver us from all such empty terrours.

62–79 : 'and now I will explain the motion of atoms, how thereby everything comes into and goes out of being : matter is not inseparably united ; it is ever going to or coming from things : every individual is thus changing, while the whole remains the same.'

80–141 : First-beginnings, when alone, move ceaselessly through the infinite void by their own inherent motion or it may be after collision with another : some of intricate shapes form after collision a close union and thus help to compose hard bodies ; others rebound to greater distances, and form softer bodies ; some do not unite at all, but continue to wander through space : the motes in a sunbeam will give some notion of this : single atoms unite into small bodies, these small bodies form themselves into somewhat larger ones ; till by little and little they become visible and are seen to move in the sun, though why they move is not seen.

142–164 : the sun rises, and the world is at once clothed in light ; yet its rays are complex, not single, and do not pass through a void : how much more swiftly then must first-beginnings move ? since they travel through a perfect void and travel singly, and each is one indivisible whole.

165–183 : 'they are greatly mistaken who think that the course of nature could not go on, nor the products of the earth and the race of men be con-

tinued without divine providence: nay I might prove from the imperfection of this world that it is not divinely created.'

184–215: you are to know too that nothing naturally mounts upwards: flames and the growth of crops and trees are only apparent exceptions: thus blood from a wound spirts up; and a log forced down into the water starts up again; yet we know these things tend downwards by nature: so it is with flame: observe meteors and the like falling to earth; the rays of the sun tending downwards; lightnings flying about and falling to the ground: this is their natural tendency.

216–224: know too that atoms while travelling down space in parallel straight lines, at quite uncertain times and spots swerve from the perpendicular to an imperceptible amount.

225–250: you must not think that the heavier can overtake the lighter atoms and so give birth to things: a heavier thing falls more quickly than a lighter through water or air, because these offer unequal resistance to unequal weights: not so with void which yields to light and heavy alike: nothing therefore can account for the first collision of atoms except this declination; which must be the least possible, that we may not attribute to them oblique motions.

251–293: again if there is no such declination of atoms to break the eternal sameness of their motions, the perpetual sequence of cause and effect, whence have all living things freewill? whence can we change our motions at pleasure? thus horses cannot start in a race at once: motion has to spread from the heart through the limbs: thus too when we are carried along by an external force, there is something in us which resists, and enables us sometimes to stop: while the weight then of atoms enables *them* sometimes to withstand the

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external force of blows, it is only this declination of atoms at quite uncertain times and places which gives the mind its freedom of action.

294–307 : the matter of the whole universe never was either more or less condensed than it is now : the motions which first-beginnings now have, they always have had and will have : what they have produced, they will again produce : the sum of things in being no force can change ; for no new matter can escape out of the universe nor come into it and change the order of nature.

308–332 : though atoms are in constant motion, yet the whole universe appears to be at rest, because they are far beneath the ken of our senses : nay visible things often when seen from a distance seem to be at rest ; as a flock of sheep feeding ; or as an army of foot and horse, if looked down upon from a height.

333–380 : know too that these first-beginnings are of many different shapes : thus no two men or other animals are quite alike ; thus a cow knows its calf among all other calves ; thus kids and lambs run each to its own mother ; thus every grain of corn, every shell is distinct.

381–397 : thus the fire of lightning can pass where earthly fire cannot, because it is formed of finer atoms : for like reasons light passes through horn, rain does not ; wine runs easily, oil slowly through a strainer, because the elements of oil are larger or more hooked, and so cannot separate so readily.

398–407 : honey and milk are pleasant to the taste, wormwood and the like nauseous ; the former therefore consist of smooth, the latter of jagged atoms which tear a way into the body.

408–443 : also what is pleasing or offensive to the other senses, to the hearing smell sight, must be formed of elements more or less smooth or

rough respectively: again some bitter flavours have elements, not hooked, but slightly prominent: those of fire and cold are jagged, but in different ways as shewn by touch, which is the body's sense, whether it is affected pleasantly or unpleasantly, from within or from without.

444–477: again things hard and dense, stones metals and the like, have hooked and branching particles; fluids have them smooth and round: things again which do not cohere, but yet are pungent, smoke mist flame, have sharp, but not tangled elements: sea-water has particles round and smooth mixed with others round but rough which give it its saltness; and these latter by filtering you may separate from the former.

477–521: hence it appears that the number of different shapes in atoms is finite: some atoms must be infinitely large, if you have an infinite variety of shapes; for say certain atoms consist of three parts or four parts: their permutations will only give a certain number of shapes: go on increasing the number of parts, the shapes after every change of position will still be only finite in number: hence to get an infinite number of shapes, some atoms must be infinitely large; which is impossible: again were the shapes infinite, what is now best in colour smell flavour sound would be far surpassed; as well as what is worst: but as it is there is a limit to all this: there is a limit too to the heat and cold of the year.

521–568: the number of shapes being finite, the number of atoms of each shape is infinite, since it was proved in the first book that the sum of matter was infinite: if you say some animals are more scarce than would be the case, if the atoms of which they were made were infinite, I answer these animals may be very numerous in remote regions; but even if but one thing of its kind existed in the

whole world, this would imply an infinite sum of atoms ; else how could these have met and united in the boundless ocean of matter : the first-beginnings therefore of every shape and kind are infinite in number.

569–580 : thus production and destruction alternately prevail, their elements ever waging equal war : no day passes without some dying, some being born.

581–599 : this you must carefully bear in mind : the more powers and properties anything possesses, the greater variety of elements it contains : thus the earth has elements out of which seas and fountains and fires, out of which crops and trees, rivers and pastures are supplied ; it is therefore called mother of gods men and beasts alike.

600–660 : her the old Greeks have personified as the great mother : she rides in a chariot drawn by lions ; wears a mural crown, has Phrygian attendants, is accompanied with noisy music, receives on all hands alms ; her followers represent the Curetes who saved the young Jupiter from his father : all which things are an allegory with some moral significance ; but beautiful as they are, they are mere fancies ; the blessed and immortal gods trouble themselves not about men : as you call the sea Neptune and the like, call the earth mother of the gods, if you please ; but remember at the same time that it is senseless matter, only containing the elements of many things.

661–699 : in this way sheep horses cattle eating the same grass and drinking from the same river all keep their distinctive differences : thus grass and each river must contain most different elements : nay the parts of the same animal are quite different ; and are formed therefore of different elements : then too fuel must contain elements of fire and flame and ash : then many things have

divers properties, colour flavour smell ; and these have all different elements as they enter things in different ways : things therefore must be of mixed seed : again as the same letters are common to different words, so the same elements may be common to most different things, to men corn trees.

700–729 : but all elements cannot unite in all ways ; else monsters of all kinds would arise : every creature has its fixed seeds, fixed mother ; and thus is kept within its limits ; and of the elements it takes as food some only remain, others are rejected as unsuitable : and so it is with inanimate as well as animate things : they have each elements different or differently combined ; and the modes of action of these elements differ, so that not only living bodies, but all nature, earth sea and heaven, are kept distinct.

730–756 : atoms have no colour whatever : the mind has to conceive them as without colour ; for any colour may change into any other ; but the first bodies are unchangeable, or things would pass into nothing.

757–787 : again if atoms have no colour, but beget any colour by their different shapes positions motions and the like, you can explain change of colour : thus the green sea becomes white : why ? by its elements changing their order, and by some going, others coming : but green elements could not become white. But if you say they have different colours, then you should see in the one colour of the sea others quite different mixed up, as in a square composed of various shapes you see these shapes : again these shapes do not prevent the whole exterior being square ; but different colours would prevent a thing being of one colour.

788–794 : we are tempted to give to atoms colour, not knowing how colour otherwise can

come : but we have seen that white can come from what is not white ; and surely white can arise more easily from no colour, than for instance from black : this reason then falls to the ground.

795–816 : again colours cannot exist without light, atoms never come into the light, therefore atoms have no colour : what colour can there be in darkness, when we see that the same thing continually changes its colour in different lights ? as therefore it is such and such stroke of light which produces such and such colour, without that stroke they cannot exist : as too one stroke produces white, another black, and as a stroke is a touch, and as it is a shape, not colour which affects touch, atoms need not colour, but different shapes to give different touches.

817–825 : again if atoms have colour, it will not be said that this or that colour belongs only to this or that shape of atom : why then should not things formed out of coloured atoms vary their colours ? why should not crows be sometimes white, swans black or green ?

826–833 : again the smaller the shreds into which a thing is divided, the more its colour vanishes : be sure then all colour is gone before a thing comes to its first elements.

834–841 : you do not assign sound or smell to things which give forth no sound nor smell : why then attribute colour to all things ? The mind can perceive things without colour as well as things without smell.

842–864 : but atoms are likewise without heat or cold, without sound flavour or smell. As in preparing a perfume you seek out a quite scentless oil, that it may not infect the perfume with its own scent ; thus first-beginnings must possess neither heat nor cold, smell sound nor flavour : these qualities are all frail and mortal, and must there-

fore be wanting to immortal elements unless things are to pass away to nothing.

865–885 : all things which have sense come from insensible elements : a visible proof of this you may see in living worms rising from the putrid earth : again grass and water change into cattle, the flesh of cattle into men, men often go to feed beasts and birds : nature turns food into what has life and sense, much as dry wood passes into flame ; so much is effected by transposition and mixture and motions of elements.

886–930 : the mind tries hard not to believe that sense can come from what has not sense ; for stones woods clods can by no mixture produce it : but, mind, it is not every element that can beget sense ; only certain atoms with certain shapes and arrangements : but even these woods and clods may, as we have seen, give birth sometimes to living things. But they who say that sense can only come from what has sense, suppose elements to be soft, as we never see sense united but with what is soft : yet suppose such elements eternal ; they must have the sense of some part or of the whole living thing : but no part can feel away from the whole thing : well then these elements must be like the whole living thing : if they are living then, they are thereby liable to death ; but even if they are not, they would make but a medley of living things, like the impossible unions of men and brutes : but if they lose their own sense, why then give it only to take it away ? nay we have just seen that sense *can* come from what has no sense.

931–943 : 'if it be said sense comes from what has not sense by a process of change or a sort of birth, I answer, birth and change both imply a previous union : before the creature is begotten, its body cannot have sense, as its matter is dis-

persed abroad and has not come together in a way to awake any of the senses.'

944–962 : a living creature receives a blow which its nature cannot endure : the senses of body and soul are stunned : the connexion of the two is broken, and the soul escapes through the apertures of the body : a blow can do no more than break up and scatter the several elements. Again the remaining vital motions can often get the better of a less severe blow, bring each thing back to its proper channel, and rekindle the senses : in this way only is the thing recalled to life.

963–972 : there is pain when the elements are disordered in their seats, pleasure when they return to their place ; therefore first-beginnings themselves can feel neither pleasure nor pain, since they are not formed of other first-beginnings, whose motions can be disturbed so as to give them pain, or rearranged so as to give them pleasure.

973–990 : if sense must be given to the elements of living things in order that these things may have sense, then must their elements have the same passions and reasoning powers which men have ; they will thus have to consist of other elements, and these again of others on to infinity : if all this is absurd, and you cannot conceive laughing or thinking atoms, why not allow generally things that have sense to come from elements without sense ?

991–1022 : nay we men, as well as beasts and the fruits of the earth, may be said to have our birth from heaven as father, and earth who as mother gives us food and therefore life : death too is but the going back of our elements to heaven and earth respectively : then in a moment all forms and colours and senses perish, which depend on the motions arrangements etc. of first-beginnings ; even as in this our poem a few letters pro-

duce by different arrangements etc. quite different verses.

1023–1047 : 'listen now to a question of vast moment. But nothing is so easy that it may not at first seem difficult ; nothing so wondrous but people cease in the end to admire it. Look at the sky with sun moon and stars : what more marvellously beautiful ? yet the world weary of the sight cares not now to give it a glance. Fear not therefore the novelty of the thing, but hear what I have to say ; and if it be true, surrender ; if false, gird yourself to the combat : the mind would fain comprehend that immensity into which it looks and in which it freely expatiates.'

1048–1066 : space then being unlimited on all sides and atoms infinite in number, it is not likely this world should be the only one in being, since it was formed by a mere chance combination of atoms : there are then in other parts of space other like combinations of matter.

1067–1076 : nay when there is matter and place ready, and nothing to hinder, and countless atoms with the s me powers as those which have formed our world, you must admit that there are other worlds with men beasts etc.—A mere variation of the last paragraph.

1077–1089 : again there is nothing that is sole in its kind, man beast bird or fish ; and so it is also with heavens earths seas suns moons ; they are all without number ; since they have all birth and death on the same conditions as each thing here on earth.

1090–1104 : the knowledge of these things will rid you of fear of the gods ; for how could any being rule these numberless heavens and earths ? how could he hurl his bolts at once in so many places, bolts too which often destroy the innocent and miss the wicked ?

1105–1174 : and after our world was born, many elements were ever added to it so as to increase all its parts, until it attained its full growth : even thus things which you see growing take in more elements as food than they give forth, until they reach their maturity ; then they gradually decay, and exhale more than they take into their veins ; until from inward rarefaction and outward blows they perish completely : even thus will our world perish : already our earth has begun to fail, and can no longer produce what once it did : tillers and vinedressers spend their labour in vain and regret the olden time, not knowing that the earth like everything else must come to its end.

BOOK III

1–30 : he addresses Epicurus as his father and guide, who had dispelled the darkness of error, explained the whole nature of things, revealed the gods and their blest abodes, and destroyed the belief in Acheron.

31–93 : I have now to explain the real nature of the soul and to dispel the terrours of hell which poison life : many boast they know all this, but when tried by adversity, they choose to suffer any misery rather than face death and its consequences: nay often men from this fear will commit any crime, in order to get wealth and honour, thinking that want and contempt destroy the security of life ; hence civil war, hence hatred of relations ; hence men often rush to death from fear of death : this fear in short is the source of all evils ; and can be destroyed only by the true knowledge of nature.

94–135 : well first the mind, *animus* or *mens*, is a part of man, as much as the foot or head : some deny this and affirm the mind's sense to be a harmony or certain life-giving state of the body by

which we have sense, though the mind is nowhere : they are quite wrong ; for often the body is sick, while the mind is happy ; the mind is wretched, when the body is well ; just as the foot may be sore, when the head is whole : again the body is often asleep and without sense, while something in us is moved by various passions. Next the soul too or *anima* is in the body and no mere harmony ; for often much of the body is taken away, while life continues ; and often when a few particles only of heat and air quit it, life is gone ; so that you see some elements are more important for life than others : this harmony therefore is nothing.

136–160 : the *animus* and the *anima* make up one nature, but the *animus* is the ruling part in the whole body and is situated in the region of the heart ; the *anima* being spread through the body : sometimes the *animus* feels, when the *anima* does not ; but under any violent emotion we see the *anima* sympathise throughout the frame with the *animus* : the *anima* therefore is united with the *animus*, and being moved by it, stirs the whole body.

161–176 : the *animus* and *anima* are therefore bodily also, since they can move and direct the body ; for this cannot be without touch nor touch without body : the *animus* too suffers with the body, when the latter is wounded : it must then be bodily, since it suffers from bodily weapons.

177–230 : the *animus* consists of very small round atoms, which can move with extreme celerity and ease ; for nothing is so swift as thought : of visible things those which move most easily, as water, are composed of very small round elements : those of the *animus* then must be eminently subtle. Again the fineness and smallness of the substance of the *animus* and *anima* are shewn by this : after death, when they have left

the body, it is not perceptibly diminished in size or weight ; you may compare it with wine whose flavour is gone or the like : the elements which compose this flavour are very minute ; and their absence does not lessen the weight and bulk of the wine.

231–257 : the *animus* is made up of spirit heat air and a fourth nameless substance the finest and most nimble than can be conceived and made of the smallest and finest atoms : from it comes the beginning of sensation which thence spreads through the several parts of the body : the least pain or hurt, if it reach to this substance, will destroy life at once.

258–322 : these four substances have their elements so mixed together as to make up a single whole ; yet as in the flesh of any animal there are different substances, which yet compose a single body : the fourth nameless substance, the first source of sensation, lurks in the inmost recesses of the body and is so to speak the soul's soul, being to the soul what the soul is to the body, and supreme over both. Thus too the three other substances must be so mixed up as to form one whole, lest their several powers acting independently should destroy sensation : every animal has in it the heat the spirit and the air, but one animal has more of one than of the other, and thus gets its distinctive character : the lion has more of heat, the stag of spirit or wind, the ox of air : so is it with men ; their characters differ as they have more of one or of another of these : yet reason will so keep down the too great influence of any of them that a wise man may live like a god.

323–349 : the soul is held together by the body and in turn keeps the body in life : the one cannot be torn from the other without destruction to both, any more than its perfume can be separated from

frankincense: by their mutual emotions sense is kindled: nor is the body ever born nor does it grow without the soul nor continue when the soul has left it: even in the mother's womb they learn in common the motions of life.

350–357: to say that the body has no sense, and that the soul spread through it alone feels, is to contradict a self-evident truth: but it is said when the soul departs, the body has no sense: yes, because sense is no inherent property, but an accident only.

359–369: the assertion that the eyes cannot see, but that the mind sees through them, as through a door, is contradicted by their sense: nay bright objects often hinder the eyes from seeing them; but this could not happen to doors; nay if eyes act as doors, we ought to see better by entirely taking away these doors.

370–395: you must not believe what Democritus teaches, that the atoms of the soul alternate one by one with those of the body, and are therefore as many in number: they are in fact not only much smaller, but also much fewer; only enough to awaken sense through the body, which often therefore does not feel very small things that come in contact with it; they not exciting any part of the soul.

396–416: the *animus* has more power over life than the *anima*: without the *animus* the *anima* cannot remain one instant in the body: but if the former is safe, much of the latter may be cut off without destroying life: the *animus* is like the pupil of the eye, the least hurt to which destroys the sight; the *anima* is like the rest of the eyeball, much of which, not all, may be cut away and sight continue.

417–444: this soul and mind (we may now use the terms indifferently) have a birth and are mor-

tal ; for they are of the smallest and finest atoms, being more easily moved than anything else, even by images of the rarest things, smoke mist and the like : as these things then melt into air, so must the soul, when severed from the body, dissolve even more quickly : how indeed, when the body cannot keep it, could the air which is much rarer hold it together ?

445–458 : again the mind is born with the body, grows with it, decays with it : in the child it is weak, in the man strong, in the aged again childish : it is natural then it should die also with the body.

459–525 : again, as the body is liable to disease, so is the mind to cares and fears ; therefore it should partake with the other of death : again when the body is ill, the mind often wanders and is senseless before death ; it ought then to die, since disease reaches it ; for that which feels disease must die : again in drunkenness the mind shares in the disorder of the parts of the body ; but if it can thus be disordered, it may be killed by a more powerful cause : again in a fit of epilepsy, the sinews stiffen, the man foams at the mouth and the like ; his mind is at the same time disordered by the attack ; then when the fit is over he rises up reeling and gradually comes to his senses : when the mind then is thus tempest-tost in bodily disease, how could it battle for ever with storms in the open air ? again the mind may be healed like the body ; it is therefore mortal ; for that which is immortal allows not of any changing or shifting of parts : the healing therefore of the mind by medicine and its suffering from disease both alike prove it to be mortal.

526–547 : again a man often loses sense and life limb by limb ; the soul then thus severed and lost must be mortal : or if you say it draws itself to-

gether from all the limbs, then the spot in which it is thus gathered ought to have a livelier sense ; but this is not so ; it therefore disperses, that is dies : nay grant that it can contract itself, you must admit it to be mortal, for equally in this case it gradually deadens, and sense and life quit the man.

548–557 : the mind is as much part of the man, as the ear eye or any other sense : none of these can exist alone, but decay at once : so it is with the mind, which is as closely connected with the body as these are.

558–579 : again body and soul depend for life one on the other : without the body the soul cannot give birth to vital motion, nor can the body without the soul continue and feel : mind and soul produce their sense-giving motions, because their atoms are kept in by the bodily frame : this they cannot do in the air ; or else the air will be a body and an animal, if the soul can move in it as it moved in the body ; therefore when the body dies, mind and soul die.

580–614 : when the soul leaves it, the body rots away : a proof that the soul has come out of its inmost depths, to cause such utter ruin : the soul then must have been torn in pieces itself, ere it got out of the body : often again in life the soul seems to fail and be on the point of going : it is so shattered then together with the body, that a more violent shock would destroy it : how then could it exist even a moment, not to say an eternity, in the open air ? a dying man feels not the soul escaping entire from him, but failing in this spot or that : if the mind were immortal, it would not mourn its dissolution, but its having to quit the cover of the body.

615–623 : why too is the mind never born in the head or foot, but in one fixed spot, if not because it,

like all other parts, has its place allotted to it, so that every member may have its due share in the body ? cause ever follows effect, nor can fire arise in water, frost in fire.

624–633 : again if the soul is immortal and can exist alone, it must have the five senses, as imagined by writers and painters ; but none of the senses can exist alone away from the body.

634–669 : since life and sense pervade the whole body, if it be cut in two by a sudden stroke, the soul must also be divided ; but what is divided cannot be immortal : a soldier's arm or foot or head cut off in the heat of battle will shew for a time remains of sense and motion : a serpent chopped in pieces will writhe and with the severed mouth seek to reach the other pieces of the body : now you cannot say that in each part there is an entire soul ; therefore the soul has been divided, and therefore is as mortal as the body.

670–678 : if the soul is immortal, why cannot we recollect what happened before our birth ? if the mind is so changed as to forget everything, that is very like death ; so that even thus you must admit that the soul which then was, has perished, and that the one which now is, is newly made.

679–712 : if the soul enters the body after it is fully formed, it should not seem to be so mixed up with it, but should have a hole to live apart in ; whereas in fact it so penetrates the whole frame that the very teeth have feeling ; it therefore has birth and dies ; else it could not be so united with the body, nor being so united, leave it entire : but if it can so enter and then spread itself over the whole body, then must it perish thus diffused ; even as food transmitted into the body perishes and then furnishes out of itself another nature : thus the soul that entered will die, and another

be formed out of it: thus still the soul will be mortal.

713–740: are atoms of the soul left behind in the dead body or not? if they are left, it cannot be immortal, since it has left parts of itself behind; if it goes out entire, whence come worms and other living things into the carcass? but if souls come from without into these myriads of creatures, do they each create a body for itself, or enter bodies already formed? but why make a body, when they are better without? disease cold hunger come from the body: but were it ever so useful, they could not make it: if again they entered it already made, they could not unite with it so closely as to have sensation in common.

741–775: again why do animals inherit the qualities of their parents, unless the mind like the body comes from a fixed seed: if the soul is immortal and passes into different bodies, why do not dogs and stags, hawks and doves, men and beasts exchange dispositions? they say the immortal soul changes with the change of body: false; for what changes is broken up, and therefore dies: if it be urged, a human soul always passes into a human body, a horse's into a horse, why then is not the child as wise as the man, the foal as the horse? the mind grows young in the young body you say: then is it mortal, since it thus loses its former properties: or how can the soul come to maturity with the body, unless its partner from the beginning? or why does it seek to quit the aged body? it need not fear its ruin; for an immortal runs no risk.

776–783: again how absurd that mortal souls should be present at conception and fight who shall get the mortal body, unless indeed they bargain, first come first served!

784–829: again everything has its proper place

assigned to it ; and thus the mind cannot be out of the body away from sinews and blood : if it could be in the head or heels or any other part of the body (and this would be much more natural than that it should be out of the body altogether) there it would still be within the man : now as mind and soul not only are in our body, but have a fixed place in that body, it is still more inconceivable that they could exist wholly out of it ; therefore the soul dies with the body : nay thus to join a mortal thing with an immortal is too absurd : but if you say the soul is immortal, because it is sheltered from all that would destroy it, that is not true : not only does it suffer with the body, but it has other ailments of its own, remorse madness lethargy and the like.

830–869 : thus the soul being proved to be mortal, death is nothing to us ; for as we felt no discomfort, when Rome and Carthage were warring for the empire of the world, we shall feel none after the dissolution of body and soul, though heaven and earth go to ruin : if our soul even do exist after death, that is nothing to us, whose identity consists in the union of soul and body : or if infinite time to come collects again and gives life to the very same atoms of which we consist, that is nothing to us, when this identity has once been broken ; even as we know and remember nothing of our former selves, if as is probable infinite time past arranged the atoms just as they now are in us : death will prevent us from existing in that future time and feeling the ills that may befall that repetition of ourselves : death then will at once make us for evermore as if we never had been.

870–893 : when a man laments that after death he will rot or be the prey of beasts, be sure there is something wrong with him : he does not separate his dead carcass from his present self ; and cannot

see that after death there will be no other self to stand by and mourn the self thus mangled, or else burnt on the pyre ; for if it is an evil after death to be torn by wild-beasts, it is surely as much one to burn in flames or the like.

894–911 : they say, you will see no more wife home and children ; but they do not add, you care not now for these ; else they would not thus grieve for you : another adds, you sleep the sleep of death, freed for ever from all ills ; but we remain to mourn evermore : you might ask this man, if the dead only sleeps, why mourn for him evermore ?

912–930 : men say glass in hand 'enjoy the moment, it cannot be recalled' ; as if after death one felt the want of wine or aught else : in sleep we have no thought for life ; how much less then in death if there can be a less than nothing ! for death is a more complete dispersion of our matter, a sleep that knows no waking.

931–977 : if nature were to say to you or me 'why lament your death ? if your life has been a pleasant one, why not go to rest satisfied with the feast ? if the contrary, why not end your troubles ? for I have nothing new to give you, if you were to live for ever' : we must allow her words to be true : if an old man were to bemoan himself, would she not with justice thus chide ? 'a truce with tears ; the fault is your own, if you have not had enjoyment' ; make way for others : they too will follow you, as you now follow those before you ; life is but a limited tenure : what took place before our birth is nothing to us ; judge from this of what the future will be after our death.

978–1023 : the stories told of hell are really true of this life : Tantalus Tityos Sisyphus, the daughters of Danaus, are but types of people tormented here by various lusts and passions : Tartarus too

Cerberus the furies have no existence ; but are pictures of the various punishments of crime in this world ; and even if these are escaped, the tortures of conscience make a hell of earth.

1024–1052 : you may say too to yourself ' the best and greatest kings conquerors sages poets, Epicurus himself, have died ; why should I then seek to live, who dream away life amid cares and delusions ? '

1053–1075 : men feel a burden pressing on their minds ; but if they knew why it weighs upon them, they would not live as they do, trying by constant change of place to escape from themselves : they would give up everything else to study the nature of things, since they have to learn what their condition is to be not for an hour, but for all eternity.

1076–1094 : again why such a craving for life mid troubles and dangers ? death cannot be shunned : no nor does length of life create any new pleasure ; while the future may bring evil as well as good fortune ; and live as long as we may, the eternity of death will ever be the same.

BOOK IV

1–25 = I 926–950 (with 6 verbal changes).

26–41 : having explained the nature of the soul, I now go on to an important question that of idols or images, which like small films constantly proceed from the surface of all things and float in the air, and often frighten us when sick or asleep : these we must not think to be souls from hell, which have survived the dissolution of the body.

42–109 : that such films or images may be discharged from the surface of things, you may learn in many ways : smoke and heat are emitted in a state of solution ; the coats of cicades, the slough of serpents in a state of cohesion : much more then

may very thin films from their outermost surface leave things and keep their shape ; just so colour is emitted, as you may see, when all things in a theatre take the hue of the awnings overhead : these images are so small as not to be visible separately ; coming too from the very surface of things there is nothing to rend them : such images invisible singly, when often repeated may be seen reflected from the surface of mirrors.

110–128 : learn now how fine these images are : and first let me remind you how exceedingly minute first-beginnings are : think of the smallest animalcule, then of its heart or eye, then of the atoms which form its soul : what is their size ? touch again a strong-scented herb with two fingers : what an amount of smell it emits ? [what then must be the size of the atoms of smell ? from all this you may conceive how thin these images or idols may be, and yet consist of material atoms :] such then fly about on all hands unseen unfelt.

129–142 : besides these images which come from things, there are others which form in the air of themselves and present the outlines of all kinds of shapes, giants mountains rocks beasts.

143–167 : images stream incessantly from the surfaces of all things : some things they pass through, by others they are broken ; from others, at once hard and bright, they are reflected back : they stream as constantly from things, as light from the sun, so that as soon as a mirror is turned to a thing, its image appears in it at once.

168–175 : often the sky in a moment is overcast with thick clouds : what a multitude then of these thin images must in an instant be shed from them, to allow of these being seen by us ?

176–229 : the velocity with which these images travel is enormous : light things made of fine atoms often travel very swiftly, as sunlight ; it is natural

then that these images should do the same ; of which too there is a constant succession one following on the other like light or heat from the sun : again these images proceed from the very surface of things and should therefore travel more swiftly than light : a proof of the prodigious swiftness of these images is this : put water in the open air, and at once all the stars of heaven are reflected in it. As images come from all things to the sight, so do things producing smell taste sound and the like ; so that all the senses are similarly moved.

230–267 : we feel a thing in the dark, and know it to be the same as we saw in the light : if what we feel is square, what square object can come in the light to our sight except its image, since a like effect must have a like cause ? images proceed from things in all directions ; but as we only see with the eyes, we only see images where we turn our sight to them. Again an image pushes before it the air between it and the eye ; this air all sweeps through the pupil, and let us judge of the distance of the object seen ; and all this takes place almost instantaneously : we do not see the images singly, but we see the object by a continuous succession of these ; just as we do not feel each particle of wind, but the effect of the whole : and so too we thump the surface of a stone, but feel its inner hardness.

269–323 (347) : the image is seen not at the surface of the mirror, but beyond and within it in the same way that real objects are seen through and beyond an open door, namely by two airs : it was explained above 246 foll. how the distance of an object from the eye was perceived by means of the air between it and the eye ; thus you see first the distance of the open doorway by one air, then comes another air between the doorway and the object outside, which lets you see how far it is be-

yond the door : thus too the mirror and its distance from us is seen by means of its image which propels before it the air between the mirror and the eye, which first sees this air, then the mirror ; then when we have perceived the latter, the image which goes from us to it, comes back to us, but drives onward an air which is seen before the image, and makes it appear so far distant beyond the mirror. Again our image in the mirror has the right answering to our left, the left to our right, because on coming against the mirror it is dashed straight out in the reverse direction, like a wet plaster-mask thrown against a post. Again a series of mirrors disposed in a certain way can bring into view all the recesses and turnings of a building. Again concave mirrors shew our image with right answering to right, left to left. Again the images step and move as we do, because when you withdraw from any part of the mirror, images cannot come from that part of the mirror.

324 (299)–378 : this theory of images will explain many other things : you cannot gaze on the sun, because of the force with which images come from it, and the seeds of fire mixed in them : the jaundiced see all things of a greenish yellow, because of the atoms of this colour which proceed from them and meet the images : we see out of the dark things in the light, because a bright clear air, advancing before the images of things in the light purges the eye of the gross air of darkness, the former air being much more minute and penetrating than the latter : we cannot see what is in the dark, because the gross air comes behind the bright and blocks up the sight against all images : a square tower from a distance looks round, because the images are blunted in their long journey through the air : our shadow seems to follow us and move as we do, because it is really nothing but

air without light; one part of the earth after another being shaded from the sun as we advance, and the parts before covered by us left exposed as we leave them.

379–468: in all this the eyes are not deceived; what they see they rightly see; it is the mind that errs in the inferences it draws: this applies to thousands of things in which the senses seem to be mistaken: when we are in a ship which is moving, it seems to be at rest, and things which it passes to be in motion: the stars which are in perpetual movement, appear to stand still: if you look down a long colonnade, the roof and floor and the sides seem at the other end to converge to a point: out at sea the sun appears to rise from the water and to set in it: the parts of a ship under water look bent and twisted upwards: when clouds scud across the sky, the stars seem to move the other way: if you press the eyeball beneath, you see all things double: when fast asleep in a small room in the dark, you often think you see daylight and are travelling over wide distances: in all this the error lies in the opinions which the mind superinduces upon what the senses really perceive.

469–521: if a man teaches that nothing can be known, how does he know that? how distinguish between knowing and not knowing? on the truth of the senses all reasoning depends, which must be false if they are false: nor is one sense more certain than another; all being equally true; nor is the same sense at one time more certain than at another: all reasoning, nay life itself would at once come to an end, if the senses are not to be trusted: as in any building, if the rule and square are wry, every part will be crooked and unstable, so all reasoning must be false, if the senses on which it is grounded are false.

522–548: the way in which the other senses are

acted upon, may now be easily understood : sound is corporeal, since it is by striking on the ear that it excites sensation : often too the atoms of sound in passing through the narrow windpipe graze it and make it rough : again a long speech spoken in a loud voice takes much strength and substance from a man : smoothness of sound comes from smoothness of its atoms, roughness from roughness in them.

549–594 : as the sounds are coming out, the tongue forms them into articulate words ; every one of which is distinctly heard near at hand ; but at a greater distance the sound is indistinctly perceived, as it gets broken in passing through the air : again a single word often strikes the ears of a whole multitude ; it must divide therefore into so many distinct words : often too voices are echoed distinctly back, sometimes six or seven in answer to one : these the wonder-loving multitude believes to be the voices and music of nymphs and woodland gods, Pan and the rest.

595–614 : sounds will come through places, through which you cannot see, because their particles can pass by crooked ways, while images can only travel through straight passages : again one voice bursts into many similar voices, as a spark of fire into many sparks ; so that all the corners of a building may be filled with sound ; but even sound is deadened and broken in coming through such obstructions.

615–632 : taste is quite as easy to explain ; the flavour is pressed out from food by chewing and passes into the pores of tongue and palate : the flavour is pleasant, if its atoms are smooth, but the contrary, if these are rough : when the food has got below the palate, the flavour is no longer perceived, and the food is then indifferent, if only it can be digested.

633–672 : I will now explain why what is one creature's meat is another's poison : all creatures differ within and without ; therefore they consist of different atoms ; and the atoms being different, the pores and passages of the whole body, and also of the mouth and palate must differ : thus if food is pleasant to one creature, its smooth elements must suit the pores of that creature ; if unpleasant, then its rough elements must more readily adapt themselves to them : and thus in disease, what was before sweet to a man may become bitter.

673–686 : next to explain smell : it must stream on all sides from many things ; but, as in taste, one kind suits one creature, another another : bees are attracted from far by the smell of honey, and so on : thus each creature is drawn to its proper food and avoids poison.

687–705 : one smell will travel farther than another, but none so far as sound ; for it travels slowly, and is soon lost, because it comes with much ado from the inmost parts of things, as proved by this that things when pounded or dissolved by fire smell more strongly : the atoms too of smell are greater than those of voice, since often a wall will stop the one and not the other ; and thus too dogs often lose the scent.

706–721 : but in the case of the forms and colours of things, as well as smells and tastes, some are suited to one creature, unsuited to another : thus for example the lion fierce as he is cannot face the cock.

722–748 : the mind too receives its impressions from images flying about on all hands, which however are much finer than those by which we see : images are of different kinds, some formed spontaneously in the air, some coming from things or formed from a union of several ; and thus we see centaurs and the like, though such never existed,

from the chance union for instance of the image of a man and horse: the extreme fineness of such images makes them readily unite, and the wondrous agility of the mind itself at once receives them.

749–776: so far as what the mind sees resembles what the eye sees, their causes must be like: now the lion we see in mind is the same we see with the eyes, both therefore are seen by images: and thus in sleep we see, for instance one who is dead, by images coming to the mind; the senses and memory being then inactive and not able to detect the absurdity: again images move as we see them in sleep, merely because some are coming others going every instant, so that they appear to be the same in different postures.

777–817: this question offers many difficulties: why does a man think of whatever he wishes to think, sea or earth or sky? while others in the same place have quite other thoughts: why too in sleep are these images seen to move rhythmically? are they forsooth trained by art? or is it that in the least sensible time many times are latent, in which many images can appear? the mind again, like the eye, in order to see must often attend and exert itself, else they will pass unheeded: again the mind adds many false inferences to what is seen.

818–822 (826): sometimes too a woman will change to a man, or the like, but in sleep we do not perceive the incongruity.

823 (822)–857: pray do not think that the parts of the body have been given us in order to be used: in truth their use arose long after their first existence: before the eyes there was no seeing, before the tongue no speaking: on the other hand the instruments of peace and war we know to have been invented after their use was known; not so

the senses and the limbs, which you must not believe to have had a final cause, as swords and shields, cups and beds had.

858–876 : the body requires food, because it loses many particles constantly, and thus an aching void is produced, which has to be filled up and the pain allayed : liquid too is taken into the body and quenches the particles of heat in the stomach : thus both thirst and hunger are appeased.

877–906 : this is how we walk : idols of walking strike the mind, and rouse the will ; next the soul throughout the body is stirred by the mind, and then the body by the soul : the body too is then rarefied, and the outer air at once enters into all the opened pores ; so that the body is pushed on as a ship by the wind ; the mass of the body being moved and steered by a few small particles, just as a big ship by the rare wind and by the hand of the pilot : thus too a machine will easily lift a heavy weight.

907–928 : sleep takes place, when the soul is scattered in the body, and part of it has gone out, part withdrawn into the depths of the body : only part however can go forth ; else death would ensue: enough must stay behind to let sense be rekindled, as fire is rekindled when buried under the ashes.

929–961 : sleep is thus produced : the body is constantly beaten upon by the outer air as well as by that which is inhaled by breathing : thus assailed within and without the body gives way, and the soul is disordered, part of it as has been said leaving the body, part withdrawing into its recesses, while the rest cannot perform its functions : thus the body too becomes languid and powerless : again sleep follows eating, because the food in passing into the system acts on it as the air does ; and the disorder of the soul is then greater than ever.

962–1036 : the dreams of men generally turn on

what has chiefly occupied their waking thoughts, whether business or pleasure : it is the same with brutes too : again the passions which are strongest in men often display themselves in dreams, as well as other mental states.

1037–1057 : 1037 *ante*, i.e. 1030 foll.

1058–1072 : when tormented by love seek distraction ; else your passions will only be increased by the absence of the object loved.

1073–1120 : moderation in this as in other passions affords the truest pleasure : indulgence only increases the force of the passion which food instead of appeasing only makes more ravenous.

1121–1140 : lovers ruin their health and fortune; and even then their happiness is often poisoned by jealousy.

1141–1191 : if there are such evils in prosperous, what must be the evils of unsuccessful love ? strive then not to fall into love ; but if you are caught, use all efforts to escape : yet men stand in their own way, and deluded find beauties even in defects : the discarded lover will refuse all comfort ; who yet, if received back, will find out his folly and be glad to get away again.

1192–1208 : yet women sometimes feel true love in return.

1209–1232 : according as the seed of the man or woman prevails at conception, the child is more like to the one or to the other ; and this is so whether the child be male or female.

1233–1277 : it is not the gods who grant or withhold offspring : conception depends on the due assortment of man and wife.

1278–1287 : often by her own virtues, from no divine interposition, a woman without personal attractions will endear herself to her husband.

BOOK V

1–54 : who, o Memmius, can adequately extol the man who discovered this system of true wisdom ? not Ceres, not Liber, far less Hercules can be compared with him : they only gave to men physical comforts or freed them from physical dangers : he bestowed on us the blessings of right reason and freed us from the far worse terrours of superstition and of the passions : surely then he deserves to be ranked as a god, the more so that he first explained the true nature of the gods.

55–90 : following in his steps I teach the inexorable laws by which all things are bound : having proved the soul to be mortal and shewn how images in sleep cheat the mind, I go on to prove the world to be mortal and to have had a beginning, and to describe how all its parts were formed ; what creatures sprang from the earth, what never existed ; how fear of the gods fell upon men : the natural courses too of the heavenly bodies I will explain, that men may not fancy they are directed by the gods and be enslaved by religion.

91–106 : well, as to the first question : this world and all its parts had a beginning and will have an end ; nay, any moment you may see it all tumbling into ruin ; may fortune avert this in our time !

110–145 : but first let me declare with more than oracular certainty that this world and its parts are not immortal and divine : nay so far from its being impious to say that they are not godlike, they are the most fitting example of what is meant by inanimate and insensible : as we shewed in III, the soul and mind cannot exist away from the body : the world then being without life cannot be divine.

146–194 : the gods dwell not in the world, but apart in seats fine as themselves : their nature is not sensible to our bodily sense, but only to the finer sense of the mind : again to say that this world was created by the gods and will be eternal, and that it is impiety to gainsay this, is sheer folly : what could induce them to take such trouble ? or what harm were it to us never to have been born ? whence did the gods get the notion of man, so as to know how to make him ? nay, this world and all in it was gradually formed by mere natural causes, as explained already.

195–234 : nay, if I did not know the first-beginnings of things, the imperfection of this world would prove to me the gods did not make it for man's use : see after all how small a part of the whole earth he can bring under tillage, and that with the sweat of his brow ; and then his labour is often thrown away : look at all the miseries he suffers, dangers by sea and land, diseases, untimely death : compare the helpless baby with the young of other animals.

235–246 : first then, since earth water air fire are all mortal, the world of which these are the parts should be deemed mortal : the world then had a beginning and will have an end.

247–260 : think not I am begging the question in asserting that earth water air fire are mortal : first as to earth : some of it you see passes away in clouds of dust ; some is carried away by floods or rivers eating their banks : again what feeds other things, is usually replenished in return ; and since earth, mother of all things, is also their tomb, the earth wastes and grows again.—In this and the next three paragraphs he shews in turn that earth water air fire all decay.

261–272 : the same is true of water : fresh supplies are constantly coming to seas and rivers ; but

the sum remains the same, because as much is taken away by the winds and the sun, and by filtering through the ground, whence the water finds its way back to the river heads.

273–280: the air too is ever changing: for whatever streams off from things, must pass into air; and thus unless the air give back as much, all things would become air.

281–305: and so it is with fire too: the sun continually sends out new light, as you may see when clouds intercept it: the light beneath the clouds at once disappears: and thus it is with lights on earth; lamps and the like are constantly sending forth fresh lights, so that the destruction of the old is concealed by the instantaneous production of the new: the same is the case with sun moon and stars.

306–317: again the hardest things, stones metals and the like are broken up by time: they had a beginning then; else they would not give way after enduring from everlasting.

318–323: if as some say the all-environing ether begets all things and takes them back at death, then must it be mortal; for it is thus subject to increase and decrease.

324–350: if the world had no beginning, why did history commence with the wars of Thebes and Troy? nay the world began but lately; and so arts and sciences are still in progress: if it be said all these existed before, but were destroyed by some great catastrophe, then you must the more admit that the world will come to an end: when it suffered so grievously, had the causes been more powerful, it must have perished altogether: thus we all know we shall die, because we have the same diseases as those who are already dead.

351–379: again that which is everlasting must either be impenetrable like atoms, or impassible

like void, or must have nothing without it into which it can pass or out of which destructive forces can come ; and this is the case with the universe : but we have shewn that not one of these conditions is true of our world ; it is therefore doomed to destruction ; and therefore it had a beginning too ; for being mortal, it could not have lasted from eternity.

380–415 : again since its chief members contend in such furious civil strife, the world may perish either when fire has overcome water, or water fire : thus as poets fable, fire once was near conquering when Phaeton was run away with by the horses of the sun : this story may represent some real event ; as may the flood of Deucalion some temporary victory of water.

416–431 : 'I will now describe how the various parts of the world were formed : as we said above, it was not by design that atoms framed it ; but after many fruitless collisions, they chanced to fall into such motions as produced the world and all that is in it.'

432–448 : then could be seen nothing that now is seen, sun stars earth sea heaven, but a strange chaotic jumble of atoms unable to combine : gradually the different parts of the world began to separate.

449–494 : the heavy particles of earth collected in the midst and squeezed out the lighter atoms of the other parts of the world : ether with its fires first burst forth and collecting on high formed the outermost sphere of the world : between it and earth the rudiments of sun and moon and stars took up their position : the earth, rid of these lighter particles, sank down still more where the bed of ocean is ; and these depressions were flooded with salt water ; and the more the earth was beaten upon by the heat of ether and the sun, the

more it was condensed, and thus increased the ocean by particles of moisture squeezed out of it, and the heavenly elements of fire which flew off from it.

495–508 : thus the earth sank to the bottom, and sea air ether were left separate, ether above all, which glides on its even way and mixes with none of the lower elements.

509–533 : the stars may move from various causes : if the whole heaven revolves, then must we say that, while an air presses on each pole and keeps it in its place, the heaven revolves with its stars by a third air which either blows on it above in the direction in which it and its stars are going, or beneath in an opposite direction ; so that the whole sphere is thus kept in motion like a water-wheel : if the heaven does not move, then may the stars move because they have in them fires of ether trying to escape and thus driving them on ; or an air blowing from some quarter may impel them ; or they may move of themselves whither their food invites them : it cannot be told for certain how this goes on in our world ; but in the countless existing worlds every one of these causes is in operation ; and one must act in this our world ; but it is rash to assert that any one must be the sole cause.

534–563 : the earth remains at rest in the midst of the world, because its weight gradually diminishes and below it is another nature closely connected with the air above the earth : thus the whole forms as it were an organic whole, and one part does not weigh down another any more than one member of the body another member, the whole having been united and working together since its first formation : see too how the light soul sustains and puts in motion the whole heavy body.

564–591 : the sun, the moon whether it shine by

its own or borrowed light, and the stars are about the same size, it may be a very little greater or less, than they appear to us ; just as fires here on earth so long as they are visible, do not increase or diminish in size to any great extent.

592–613 : the great amount of heat and light proceeding from so small a sun may be explained in several ways : the sun may be the well-head to which the light and heat of the whole world flows : or the air about it may be of a nature to catch fire : or much unseen fire may exist in the neighbourhood of the visible sun.

614–649 : it is by no means clear how the sun performs its annual course, and how the moon in a month goes through the same journey : Democritus may be right who says that the nearer any body is to the earth, it is carried on less swiftly by the revolution of the heaven : now the moon is nearer than the sun, the sun than the signs of the zodiac : therefore the moon seems to travel faster than the sun, the sun than the signs, because in truth they in their revolution with the heavens catch up the moon which is slowest first, and then the sun : or two airs may blow in turns in cross directions, one of which drives the sun from the summer to the winter signs, the other drives it from the latter to the former : and so with moon and stars.

650–655 : night comes, either because the sun is extinguished, or, if that is not so, because he passes beneath the earth in the same way as he passed above it.

656–679 : daylight returns at stated hours, either because the same unchanged sun passes under the earth and comes above it again, or because the fires of a new sun collect every morning at the proper time : this may well be ; for many things, such as puberty in man, come at a certain

time ; and many things such as snow rain lightning return pretty regularly : so it has been from the beginning and so it continues to be.

680–704 : days and nights lengthen and shorten time about, either because the sun continuing the same chooses to run in unequal curves above and below the horizon, his course above being as much more or less than a semicircle, as his course below is less or more, until at each equinox the two are equal : all this you may see marked on a map of heaven : or else the air is denser in some parts than in others, so that he travels more slowly through the former ; and thus the winter nights are longer : or else a new sun is always born, and in successive parts of the year his fires collect more or less quickly and so rise in particular quarters.

705–750 : the moon may borrow its light from the sun, increasing as it recedes from him, until, when directly opposite, it shews its full face ; and again diminishing as it again approaches : in this case the moon must be a round ball moving below the sun : it may shine too with its own light, and its partial or total concealment may be caused by an opaque body invisible to us getting between it and us in various ways : or thirdly it may be a ball half bright half opaque which presents to us all these various phases, as the Chaldees assert in opposition to the first hypothesis, that of the astronomers : or lastly a new moon may be born daily, each successively presenting a different phase : thus many things, for instance the four seasons, come round in regular order.

751–770 : solar eclipses may be caused by the moon intercepting the rays, as the astronomers say ; but some opaque and invisible body may just as well be the cause : or the sun may lose for the time his own light in passing through spots inimical to it : lunar eclipses may similarly be ex-

plained, mutatis mutandis ; thus in the first case it will be the earth which keeps from it the sun's rays.

771–782 : 'having thus explained how all that goes on above in the heaven may take place, the movements of sun and moon and their eclipses, I now come back to the infancy of the world and the earth and proceed to shew what then took place.'

783–820 : first herbage sprang up, then trees, then living things : in the newness of creation the earth produced the larger creatures, birds first, even as now it produces spontaneously worms and the like : then lastly man, whom it fed from its pores with a moisture resembling milk : in the perpetual spring of the new world the children needed nothing more than what the earth thus supplied.

821–836 : thus mother earth produced in the beginning every kind of living thing, till she left off bearing from age ; for she and the world change like everything else : all things have a time of vigour and decay. 821 *etiam atque etiam*, I cannot too often repeat this.

837–854 : at first the earth tried to produce monsters of all kinds, half-men half-women, creatures without feet or without hands or mouths, or with limbs not separated ; so that they could not grow up nor continue their kind : they all therefore perished off.

855–877 : many races of regularly organised creatures must have died off, because they wanted either some natural power by which to protect themselves, or could not be turned to use by man and be saved thereby : these fell a prey to others and disappeared, unable to endure the struggle for existence.

878–924 : but centaurs and the like with two-fold natures cannot exist : the horse has reached

maturity when the boy is scarcely yet weaned ; and is worn out ere the other is grown to manhood : and so with Scyllas, half-maid half-fish : then since fire burns lions like other creatures, how can a chimera exist breathing out flame : earth in its freshness produced many things, but not these figments of poets or philosophers.

925–987 : but men were then much hardier than they are now : they lived like the beasts of the field ; ignorant of tillage, they fed on what the earth supplied of itself, acorns and berries ; and drank of the running waters : they were without fire or clothes or houses, without law government marriage : they slept on the ground, not fearing the dark, to which they had been used from childhood : they rather dreaded real danger from the fiercer beasts.

988–1010 : men then died much about the same as now : here and there they were mangled by wild-beasts and perished from want of help ; but then many thousands did not fall in battle in a single day : ships too and therefore shipwrecks were unknown : want and ignorance then caused some deaths ; as now do luxury and malice.

1011–1027 : next the use of huts and skins and fire softened their bodies, marriage and the ties of family their tempers : then neighbours made treaties of friendship and alliance, which mostly they observed, though not always.

1028–1090 : nature and need prompted men to the use of speech ; for all creatures feel their natural powers : the calf will butt before his horns protrude ; and so with other beasts birds etc. : it is absurd to suppose that one man could have invented speech ; for how could he himself know what he wanted to teach, or persuade others to learn ? and why should not man take to applying different sounds to denote different things, when

brute beasts use different cries to express different passions ? as we see in the case of dogs horses seagulls crows and other creatures.

1091–1104 : lightning first gave fire to men ; or else the friction of trees rubbing together : cooking they would learn from the sun, which they would see softening and ripening things.

1105–1135 : every day men of genius invented improved methods of life : cities were built, lands and cattle allotted at first according to merit ; but soon the discovery of gold gave all power to the wealthy : men would not learn how little was needed for happiness ; they therefore sacrificed everything for power and eminence, often when they had reached the summit, only to be again dashed down : let men thus struggle on along the path of ambition, since they have no true enjoyment, being really the slaves of their own dependents.

1136–1160 : thus kings were overthrown, and the rabble scrambled for supreme power ; till nations weary of violence established laws and constitutions : then fear of punishment restrained men, as injustice generally recoils on the wrongdoer, and if he escape punishment, he cannot escape the terrours of conscience.

1161–1193 : men believed in and worshipped gods, because they saw with their waking minds and still more in sleep shapes of preterhuman size and beauty and strength : as these shapes were ever present and as their might appeared so great, they deemed them to be immortal ; and to be blessed, because they could do such deeds and had no fear of death : they saw too the seasons change, and all the wonders of the heaven ; they therefore placed their gods in heaven and believed all things to be governed by their providence.

1194–1240 : what misery men brought on them-

selves by assigning to the gods such powers and passions ! the ceremonies of superstition shew not genuine piety which consists rather in despising such things : true when we look up to heaven and think of its beginning and end, this fear of the gods is apt to seize on us : nay who does not dread the thunder, lest it be a presage of divine vengeance ? think too of generals and armies whelmed in the sea ; of all man's glories dashed down to the dust by some hidden power : no wonder that men abase themselves before the gods.

1241–1280 : the metals were discovered through the burning of woods which baked the earth and caused the ore to run : with these they made arms and tools : brass at first was rated more highly than useless gold and silver ; now it is the contrary : thus things in turn flourish and decay.

1281–1307 : for arms men used at first hands nails teeth clubs, then fire, then copper or brass, at last iron ; horses next, then chariots, then elephants were employed in war, strife begetting one horrour after another.

1308–1349 : bulls boars lions too were tried in war ; but they often turned upon their owners, as elephants are sometimes seen to do now : probably they were employed by the weaker side only in despair.

1350–1360 : weaving came into use after iron which is needed for the instruments employed in it : men first practised it, afterwards women.

1361–1378 : nature first taught to sow plant graft : then one kind of culture after another was discovered, and more and more ground brought under tillage.

1379–1435 : birds taught men song ; from the whistling of the zephyr through reeds they learnt to blow through stalks : next the pipe came into use, with which they amused themselves mid other

kinds of rustic jollity : with such music watchers would while away the time, and derive no less pleasure than now is gotten from elaborate tunes : then acorns skins beds of leaves were given up ; though fought for once as eagerly as men now strive for purple and gold : lust of gain and cares came next to vex life.

1436–1439 : the sun and moon taught men the seasons of the year.

1440–1447 : then came walled towns, division of lands, ships, treaties between states ; and, when letters were invented, poetry.

1448–1457 : thus by degrees experience taught men all the useful and graceful arts, one advance suggesting another, till perfection was attained.

BOOK VI

1–42 : Athens first gave mankind corn and laws ; but better than all him who, when he saw that men had all the necessaries and refinements of life and yet were miserable, taught them true wisdom and the way to true happiness and rid them of empty cares and fears.

43–95 : once more I mount my chariot, to tell what remains to be told of the things which go on above us, and to dispel the causeless fears of men who believe such things to be tokens of divine wrath : the gods will indeed plague you, if you so believe ; not that they will themselves do you any hurt, but the images proceeding from their holy bodies will stir up these vain fears and poison existence. I have now therefore to sing of thunder, of tempests, of other things that take place in the sky.

96–120 : thunder comes from the collision of clouds : the denser they are, the deeper the rum-

bling: sometimes the noise is like that of a sheet of canvass blown about, sometimes like the crackling of paper: sometimes the clouds graze each other sideways and occasion a dry protracted sound.

121–131: sometimes the thunder makes a noise like the crack of doom, when a storm of wind eddies round within a cloud and hollows it out, until at last it explodes with a frightful crash.

132–159: thunder may likewise come from winds blowing through rough branchy clouds; or from the wind bursting the cloud by a direct onset: or waves may break in the clouds, like those on the sea; or the hot bolt may fall into a wet cloud and hiss like hot iron; or into a dry one and make it crackle like bay-leaves in the fire: again the crash of hail and ice in the clouds compressed by the wind may be the cause.

160–172: the flashes of lightning are struck out by the collision of clouds: the flash is seen before the clap is heard, because light travels faster than sound.

173–203: I explained before how the wind eddying about within a cloud would hollow it out: well the rapid motion heats this wind; and when it escapes from the cloud, it scatters about its seeds of fire: thus you first see the flash, and then hear the noise: this takes place when the clouds are piled up high one on the other: the winds within these make a great roaring and gather flame within them, as in a furnace, till at last they burst out.

204–218: fire of a clear gold colour sometimes darts down to the earth, because the clouds have in them many atoms of fire, and draw many from the sun; when therefore they are compressed by the wind, they emit these seeds of flame without noise or disturbance.

219–238: the marks left by the thunderbolts

themselves prove them to be of the nature of fire : this fire consists of atoms of extreme fineness, which nothing is able to stop : they are far more powerful than those of the sun.

239–245 : now to explain the origin and prodigious force of thunderbolts.

246–322 : that thunderbolts are formed in dense masses of clouds our eyesight tells us : the wind gathers the seeds of fire in these clouds, and gets ignited by them and the heat from its own rapid motion, till it bursts forth with flashes and loud rattlings followed by heavy rain : sometimes a wind from without bursts a cloud charged with thunder : sometimes the wind gets fired on its journey, losing some of its own atoms and gathering from the air atoms of fire : sometimes the mere force of its blow strikes out fire, as cold steel strikes fire out of a stone ; though the wind after such rapid motion can never be quite without warmth.

323–378 : the thunderbolt derives its velocity from a union of causes : it acquires momentum within the cloud : as it bursts out of it, this is increased on the principle of missiles discharged from an engine : its atoms are extremely fine ; add to this the natural tendency downward, which increases continuously ; perhaps too it is aided by blows from atoms which it gathers to itself in the air : its subtle atoms pass through the pores of some things ; burst asunder others ; melt others. In autumn and spring thunder is most frequent, because then there is a mixture of heat and cold, of fire and wind, as well as moisture ; all of which are needed to forge it.

379–422 : such is the true explanation of thunder, not the follies taught in the Tuscan rolls : if the gods do hurl the bolts, why do they pass over the guilty and so often strike the innocent ? why

does Jupiter thunder only when the sky is clouded ? why does he waste his bolts on the sea ? why not tell us to beware, if he wishes us to escape ? why thunder, if he wishes to take us unawares ? how can he hurl at once in so many places ? why destroy his own temples and statues ? why so often strike the mountain-tops ?

423–450 : presters are thus formed : if the wind cannot break the cloud, it forces it down in the shape of a column to the sea, where it bursts and causes a furious boiling and surging : sometimes the whirlwind will gather up atoms of cloud and wrap them round, and will so imitate a real prester : this will shew itself sometimes on land, but oftener on the sea.

451–494 : clouds are thus formed : first many particles in the sky get entangled and form small clouds ; and then these unite, until the sky is overcast : thus high mountains are seen to smoke with mist, because the small particles of cloud are first carried to these by the wind : then moisture steams up from the sea and rivers ; and the pressure of the ether above condenses it : finally many atoms, flying as I have shewn through space, come into this heaven of ours, and increase the mass from all sides.

495–526 : rain comes in this way : many particles of matter rise with the clouds from all things ; then the clouds suck up much moisture from the sea and rivers : thus the clouds both by their own weight and the pressure of the wind emit rains ; and these are increased by the sun helping to dissolve the clouds : rains are heavy and lasting, when these causes combine, and the reeking earth sends its moisture back : the rainbow comes from the sun shining right upon a mass of cloud.

527–534 : all other like things, whether existing by themselves or formed in the clouds, snow wind

hail frost, may be all easily explained, if you understand the properties of atoms.

535–556: earthquakes have more than one cause: underground are caverns rocks rivers lakes: well when any of these caverns tumble in, whole mountains may fall and shake the earth: or if a mass of earth tumble into the large pools of water, the oscillation of the water may make the earth reel.

557–576: again when the wind underground presses on these caverns, the earth above leans in the same direction, so as to bring things within an ace of destruction; a presage of the earth's total ruin, which must come one day.

577–607: again when wind and air enter from without or rise up from the ground into these caverns, after eddying about they sometimes cleave the crust of earth and swallow up whole towns; or, if they do not break through, yet they cause the earth to quake, and excite in men a feeling that the world will one day perish.

608–638: the sea does not grow larger, because its size is enormous compared with the supplies from rivers and springs and rains: the sun and winds too and clouds all draw off much, as they act upon so wide a surface: then as water comes through the porous earth into the sea, it passes in like manner from the sea back to the earth.

639–646: now to explain the eruptions of Aetna, one of which struck neighbouring nations with such fear and awe.

647–679: to understand such eruptions, reflect that our world is a smaller fraction of the universe than a man is of the whole world: now we are not surprised when a man is seized with any one of numerous diseases, the seeds of which our world supplies: why then wonder that out of the universe should rise up the seeds of these or any other

great natural convulsions ? if you say the conflagration is here too great to comprehend, I reply that its rarity only makes it so appear ; as we are creatures of habit, and wonder at what is strange and cease to wonder at what is common.

680–702 : Aetna emits its flames in this way : caverns of rock run under it, full of wind which heats first itself and then the rocks and earth with which it comes in contact, and then bursts out with flame ashes smoke and huge stones : again caverns reach from the sea to the mountain : through these pass from the sea water and wind mixed : this wind and water force up flame and rocks and clouds of sand.

703–711 : in the case of many things you must state several causes, to be sure of including the actual cause : for instance if you see a dead body at some distance, you may have to suggest this and that cause, though you are sure only one has occasioned the death.

712–737 : the Nile may rise from various causes : from the etesian winds blowing up the stream and stopping the waters : or from sand accumulating at the mouth : or perhaps rather from the rains at its source caused by these winds collecting the clouds there against the high mountains : or from snow melting on the lofty Ethiopian hills.

738–768 : Avernian districts are so called because birds cannot live there : there is one at Cumae, another in the acropolis of Athens, another in Syria : the effects are quite natural, so that you need not look on them as the gates of hell.

769–780 : let me repeat that the earth has atoms of all shapes, some pleasant, some offensive to the taste, and to all the other senses.

781–817 : then many things are noxious, often fatal, either to men generally or to men in certain conditions of health ; as the shade of certain trees,

steam of hot water, fumes of charcoal, sulphureous exhalations, still more those from mines.

818–829 : in the same way these Avernian spots send up a poisonous steam, so that birds on coming across it are disabled and tumble down ; and when they reach the sources of it, are quite killed.

830–839 : sometimes this exhalation causes a partial void, so that the bird cannot support itself on the wing, but falls down and perishes.

840–847 : the water of wells is colder in summer, because they let out their seeds of heat through the earth which is then rarified by heat : the contrary is the case in winter for the contrary reason.

848–878 : the fountain by the temple of Hammon is cold by day, warm by night, not, as is absurdly said, because the sun below the earth warms it, but because the earth about it condenses at night and so squeezes into the water its seeds of heat ; and then by day receives these back again.

879–905 : there is also a cold fountain which ignites tow or pine-wood put over it : it contains many seeds of latent fire, which rise up and set on fire this tow or wood, as flame will light a freshly extinguished wick, before actual contact.

906–916 : to discuss now the magnet, a stone which has the power of attracting iron, and communicating this power to a series of pieces of iron.

917–920 : but many points have to be cleared up, before we come to the actual question.

921–935 : we have said already that particles are constantly streaming from all things, which affect in various ways all the senses.

936–958 : let me repeat that all things in being are of rare and porous bodies, so that particles can and do pass through them in all directions : this is proved by the whole of nature.

959–978 : again particles emitted from bodies

act very differently on different things: fire hardens one thing melts another; and so does water: what is pleasant to one creature is hateful to another.

979–997: once more, the pores of things differ, as well as the particles which things emit; so that by different kinds of pores the different senses receive each its own object: thus too one thing will pass through a metal, another through wood, and so on; and one thing will pass more quickly than another through the same pore or opening.

998–1041: and now we can easily explain the magnet's attraction: particles streaming from it cause a void between it and the iron; these particles in a united mass fill the void, and as the particles of iron are very closely packed, the whole ring must follow, when a certain number have thus advanced: this takes place on all sides, as particles stream from the magnet all round, if not by their own motion, yet by impact: as there is a void too on one side of the iron, the air on the other sides helps to push it on as well as the air in motion within the ring.

1042–1064: but if brass come between the magnet and the iron, then the iron is repelled, not attracted; because the stream of particles from the brass first fills the pores of the iron; those from the magnet follow, and finding the iron already occupied, beat on it and repel it: other things are not thus repelled like iron for various reasons: gold is too heavy, wood too porous, iron is the due mean.

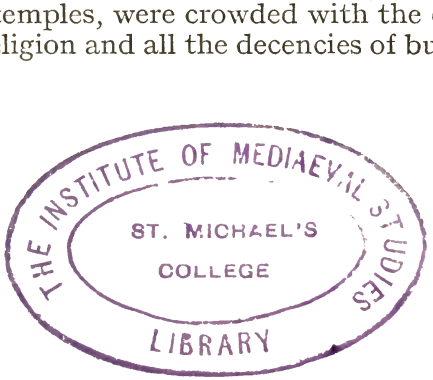
1065–1089: the fact that only iron is attracted by the loadstone need not excite wonder: many things can be joined together only by some one substance, stones woods various metals: then some liquids will mix, others will not: in all cases of mixture and adhesion the cavities of one sub-

stance must mutually come in contact with and fit the solid parts of the other : sometimes too the union is like that of hooks and eyes, as indeed seems to be the case with this stone and iron.

1090–1137 : now to explain the cause of diseases : many particles, both salutary and noxious, are ever flying about : sometimes the latter are able to corrupt the air ; then comes pestilence, either in clouds and vapours, or out of the corrupted earth : it is seen what effects change of climate has on men, and how much climates differ, and how particular diseases infest particular countries : thus a strange atmosphere can come to us in mists and vapours and corrupt our air, and fall on the water we drink or the food we and other creatures eat, or make us inhale infection : thus it comes to the same thing whether the bad atmosphere travels to us or we travel to it.

1138–1251 : a plague thus engendered once devastated Athens : a large portion of the people were attacked by it ; many of them after every form of bodily and mental suffering died in a few days ; others later from the subsequent effects ; others escaped, often with the loss of some member : medicine was of no avail ; even friends and relatives frightened by the infection often deserted the sick.

1252–1286 : the country-people flocked into the town and increased the misery : all public places, even the temples, were crowded with the dead and dying : religion and all the decencies of burial were neglected.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